Contribution ID: **575** Type: **Poster**

2P07 - Examination of stability against beam parameters in a Ku band helix TWT

Tuesday, 25 June 2019 13:00 (1h 30m)

A Ku band tape helix TWT with a center frequency of 13.25 GHz which was chosen for the RF driver present in our lab for a future prototype, was modeled and simulated using CST MWS and CST PS. Connectors for the RF input and output were also modeled in two different types. Firstly, a 50 Ohm coaxial connector was modeled and directly coupled to the helix and secondly an impedance matching section starting with a 50 Ohm and gradually increasing until coupling section to the helix was modeled. Beam parameters such as voltage, current and radius were swept while the other two were held constant. Aim of the study was to investigate the beam parameters for optimum operation and effects of matching were also studied in simulations. It was observed that a system that breaks down due to oscillations could, in some cases, be recovered just by proper matching.

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Session Classification: Poster - Microwave Generation and Plasma Interactions and Pulsed Power Switches and Components

Track Classification: 2.3 Slow-Wave Devices